Received from < > at 9/23/02/6:27:28 AM [Eastern Day זיסמן ושות' רוברטס.

SHIBOLETH, YISRAELI, ROBERTS

ADVOCATES, PATENT ATTORNEYS & NOTARY

TEL AVIV ADDRESS

44-46 MONTEFIORE ST., TEL AVIV 65201, ISRAEL TEL: 972-3-7103311, FAX: 972-3-7103322 e-mail: manager@shibolet.com WEBSITE: www.shibolet.com

RAANANA ADDRESS

312 GIRON CENTER, P.O.S. 410 RAANANA 43103, ISRAEL TEL: 972-9-7713585, FAX: 972-9-7713593

NEW YORK ADDRESS Anny float 203 486 1150 RICHARD M. ROBERTS

EMPIRE STATE BUILDING 350 FIFTH AVENUE, 60th FLOOR NEW YORK, N.Y. 10118. TEL: (212) 244-4111, FAX: (212) 563-7108 SHLOMIT OPHIR-HAREL LIMOR PELED DIKLA PILIDIK

> DANA RAUCHER **JOIT REITER** HAGIT SAMUEL

OFER SHAPIRA AMNON SHIBOLETH ORIT STERNHELL-ZALTZMAN

AVIGDOR RABINOVICH

HAGAI TIOMKIN YAACOV YISRAELI TALYA YISRAELI ITZHAK ZISMAN

INTELLECTUAL PROPERTY DEPARTMENT

EDWARD LANGER B.S.E.E., M.B.A., J.D. - ADV. & PAT. ATTY. (Israel Bar), REG. US PAT. ATTY. (Pennsylvania Bar) e-mail:e.fanger@shibolet.com

Mr. Peter Medley, Examiner US Patent and Trademark Office, Group Art Unit 2834 Washington, DC 20231

Re: US Pat. Appln. S/N 09/685,718

September 23, 2903 BY FAX (703) 746 4138 " METHOD UTILIZING THE SAW VELOCITY DISPERSION EFFE WEIGHTING BY SHAPING THE ELECTRODE FINGERS..."

Our file: A-378-0 US

Dear Mr. Medley,

LIOR AVIKAM SAVYON LAMIT

HELENA BEILIN

RUTH DAGAN

AMIR FISHER

ALMOG GEVA DOV GOVRIN

OREN HEIMAN

ROTEM HARARI

MIRIAM HELLER LIDJI

HILLEL ISH-SHALOM

DR. YUVAL KARNIEL

BOAZ LAHOVITSKY

DAVID BERNHEIM

JONATHAN FEIGIN

MICHAL GOTTESMAN-BARAK

RON BEN-MENACHEM

GIL ARIE

Thank you for the opportunity to discuss the subject matter with you, hopefully we can do this today by telephone at your time 9:00 AM.

I have attached a Power of Attorney form signed by the inventor, adding my name as attorney of record.

I have also attached a proposed new claim (31) and a table of comparison between the prior art and the present invention.

Please review these materials so that we can discuss them today or another convenient time.

A significant point to keep in mind was stated in the earlier response filed by the previous attorney on Jan. 4, 2002. This refers to the fact that the Yatsuda reference does not relate to interdigital transducers nor to the weighting of IDTs. In general, the prior art discloses fingers which are arranged and tapered to compensate for and reduce the effects of velocity dispersion. As he stated in that response, "In stark contrast to the prior art, the finger shaping called for by the present invention is provided for precisely the opposite reason, i.e. in order to induce the velocity dispersion effect, thereby weighting the transducer itself and/or focusing the propagated SAW beam."

It is believed that new claim 3\$ presents language defining over the prior art with regard to the variable ratio inducing SAW velocity dispersion, to provide a weighting mechanism to control weighting coefficients for achieving desired frequency characteristics of the IDT.

Looking forward to discussing this matter with you.

Edward Langer, Pat. Atty Registration No. 30,564

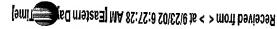
8992.0N l d

26kaaqABPEEE

Sincerek

23.5ep. 2002 12:35





Yuri Abramov, 19:25 22/09/02 +0, key words such as: "periodicit

Date: Sun, 22 Sep 2002 19:25:24 +0200 From: Yuri Abramov <yuria@scopus.net>

Subject: key words such as: "periodicity", "arrangement", "shaped", "configured", etc.,

To: Yerucham Teitelbaum <peruchal@netvision.net.il>,

Ed Langer <edlanger@netvision.net.il>

Cc: yuri_a@netvision.net.il X-MIMEOLE: Produced By Microsoft Exchange V6.0.5762.3

Thread-topic: key words such as:
"periodicity", "arrangement", "shaped", "configured", etc.,

Thread-index: AcJiXOOVx5DDv7BPTeOiRlGNHTzHTw=

X-MS-Has-Attach:

X-MS-TNEF-Correlator: <714864C61F42474DA303505B01544D1524322A@hermes.

Edward and Yerucham,

In order to help you to find important key words such as: "periodicity", "arrangement", "shaped", "configured", etc., into the disclosure description, I pay you attention to:

(a) Page 8, lines 23-30
The second term is defined by the mechanical load, i.e. by densities and elastic constants both of the piezosubstrate and the electrode finger material, as well as by the periodicity of the fingers and their geometry: thickness and width. Both of the terms vary smoothly with an electrode finger's width. Calculations show that if an electrode finger's width is in the range from 25% to 60% of the distance between the adjacent finger's centers, both of the terms are approximately proportional to the electrode fingers width. So if the electrode fingers change in width along their length, the SAW velocity dispersion is expected to occur in the same direction.

(b) Page 11, lines 23-25 The SAW velocity dispersion depends on both electrical and mechanical load, i.e., it depends on the material both of the piezoelectric substrate and the electrode fingers and depends on the thickness, configuration, polarity and arrangement of the electrode

(c) Page 15, lines 24-27 SAW velocity dispersion causes frequency response widening for an interdigital transducer with electrode fingers which change in width along their length, in contrast to a transducer with conventional electrode fingers, i.e. wherein the fingers are either of uniform width along their length or of width configured in alignment with tapering of the transducer.

(d) Page 21, lines 1-2 SAW velocity dispersion causes frequency response widening for an interdigital transducer with electrode fingers which change in width along their length, in contrast to a transducer with conventional electrode fingers, i.e. wherein the fingers are either of uniform width along their length or of width configured in alignment with tapering of the transducer.

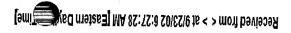
(e) Page 24 -- Claim 1 A transducer for surface acoustic waves, said transducer comprising a plurality of interdigitized electrode fingers, including at least one interdigitized electrode finger which is provided with a shape that changes in width along said finger's length, provided that where a transducer is tapered, said electrode finger width is not uniformly changed to maintain alignment with tapering of the transducer,...

(f) Page 24 -- Clam 3 A transducer according to claim 1, wherein said electrode fingers are arranged without regard to uniformity of periodicity along the lengths of electrode fingers.

A transducer according to claim 1, wherein said electrode fingers are arranged without regard to uniformity of periodicity in the direction of the wave propagation through said transducer.

(h) And even General Claim 23: A SAW transducer having electrode fingers shaped in order to produce a SAW velocity dispersion effect.

that assumed any shaping to achieve purposely the SAW velocity dispersion.



Applicant's new independent claim (Sep.23, 2002)

electrode fingers shaped and arranged with a predetermined periodicity, as he of said fingers, defining a ratio between its width and its arrangement-periodicity, such that said ratio varies substantially along each of said fingers, said variable ratio inducing SAW velocity dispersion along said fingers, thereby providing a weighting mechanism to control weighting coefficients for achieving desired frequency characteristics of the IDT.

Table 1. Regarding the independent claim 4(rejected), 24(rejected), 3% (new)

Row No	Prior Arts (including Yatsuda's Disclosure)	Applicant's Disclosure
1	Tapered IDT	IDT Weighted By Novel Mechanism
	The whole IDT and the fingers are similarly tapered to achieve a ratio $w(y)/p(y) =$ Constant, thereby providing a substantial absence of SAW velocity dispersion, where $w(y)$ is the finger's width along their length and $p(y)$ is the periodicity arrangement of the fingers.	A variable ratio, for example in Applicant's Fig. 3, results the finger shapes substantially different from the shape of the overall IDT. The fingers are trapezoidal, while the IDT is substantially rectangular.
2	Tapering As A Weighting Mechanism	Velocity Dispersion As A Weighting Mechanism
	Yatsuda illustrates periodicity of fingers grating in Fig. 2, where the overall IDT is tapered. The periodicity is changed from P _H to P _L , i.e. from high periodicity to low	The disclosed SAW IDT is weighted by the novel mechanism of SAW velocity dispersion.
	periodicity. A periodicity tapering causes that the voltages between fingers are distributed with different periodicity from top to bottom of the "fan-type" IDT.	When SAW velocity is dispersed along internal fingers, we get the effect of different time-delay of SAW beams, propagating in different SAW tracks for each y .
	A tapered IDT provides weighting, because distribution of voltages between fingers varies in periodicity from top to bottom.	The time-delay distribution causes a phase weighting of the SAW tracks distributed along the fingers. The distributed phase weighting is utilized for weighting coefficients definition.



 (Applicant's Fig. 2b) having tapered fingers is calculated by: A₂₅(ω) = E(ω) ∑_{n=1}^N p_n ∫_{-L/2}^{+L/2} exp(-j(κ₀) x_n(y)) dy (3) where p_n is a polarity of the nth finger: p_n =(-1), if nth finger is grounded, and p_n =(+1), if nth finger is hot; κ₀ is a SAW wave number, κ₀ = ω/V, V is a constant SAW velocity for each y, because of the constant ratio w(y)/p(y); x_n(y) is the X-coordinate of nth finger's center. The weighting is achieved by the varying of the fingers positions via Y-coordinate. The SAW velocity dispersion effect is NOT a degree of freedom for weighting for such an IDT. The same words are relevant to the equivalent prior art fan-type/tapered IDT, shown in Fig. 2 by Yatsuda 	The frequency characteristic of the IDT having trapezoidal fingers is: $A_{30}(\omega) = E(\omega) \sum_{n=1}^{N} p_n I_n \exp(-j\kappa_0 x_n)$ (4a) where the weighting coefficients I_n vary with finger number n , ONLY if the SAW velocity dispersion effect is present. Now, the SAW wave number is dispersed along Y-coordinate: $\kappa_0 + \kappa(y)$, and the weighting coefficients I_n are calculated via the dispersion $\kappa(y)$. Control of the values I_n due to varying the fingers' shapes, which substantially different from the shape of the overall IDT, is the novel degree of freedom, and is the essence of the disclosure. An example calculation of frequency response for an IDT having fingers, shaped in form of curled brackets, is illustrated in Applicant's Fig. 6a (64).

6:27 AM 9/23/02 Transmission Record
Received from remote ID ""
Unique ID: "PME3D8EB45B373C"
Elapsed time: 2 minutes, 20 seconds.
Used channel 2.
No ANI data.
No AOC data.
Resulting status code (0): No Errors
Pages sent: 1 - 5